



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/889,571 | 04/23/2002 | Yoshiki Nakagawa | 010903 | 1695 |

23850 7590 03/05/2003

ARMSTRONG, WESTERMAN & HATTORI, LLP
1725 K STREET, NW
SUITE 1000
WASHINGTON, DC 20006

EXAMINER

ZALUKAEVA, TATYANA

| | |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

1713

DATE MAILED: 03/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

12

Office Action Summary

Application No.

09/889,571

Applicant(s)

NAKAGAWA ET AL.

Examiner

Tatyana Zalukaeva, PhD

Art Unit

1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-51 is/are pending in the application.
- 4a) Of the above claim(s) 19-51 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-51 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Claims 19-57 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected inventions, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 11.
2. Applicant's election without traverse of claims 1-18 in Paper No. 11 is acknowledged. Election of terminal alkenyl group and 4-vinylcyclohehene as compound (I) is acknowledged.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 13-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claim is indefinite if undue experimentation is involved to determine boundaries of protection. This rationale is applicable to polymer "obtainable" by a stated process because any variation in any parameter within the scope of the claimed process would change the polymer produced. One who made or used a polymer made by a process other than the process cited in the claim would have to produce a polymer using all

Art Unit: 1713

possible parameters within the scope of the claim, and then extensively analyze each product to determine if this polymer was obtainable by a process within the scope of the claimed process. See ***Ex parte Tanksley***, 26 USPQ 2d 1389.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Art Unit: 1713

6. Claims 1-7, are rejected under 35 U.S.C. 102(b) as being anticipated by Shaffer (U.S. 5,523,359).

Shaffer discloses a production method of a living polymer by a living polymerization process, said polymer having a terminal halide group (abstract and Fig.1, upper structure). Further the copolymer having such terminal group is treated with silyl enol ether to introduce another functional groups (abstract). A class of preferred products have a narrow molecular weight distribution (M_w/M_n), more preferably 1.75 or less. Likewise the method described above produce polymers having a greater degree of functionalization than previously available commercially viable processes. In a preferred embodiment the degree of chain end functionalization is more preferably 90% or more, as measured by proton NMR (col. 6, lines 19-29). Table 7 provides for structures of initial living polymers having functional end groups R, wherein the first structure represents the residue of vinylcyclohexene and Y; as a converted end group.

7. Claims 1-4, 8-12 are rejected under 35 U.S.C. 102(a) /102(e) as being anticipated by Matyjaszewski et al (U.S. 5,763,548).

Matyjaszewski discloses ATRp process (abstract) to obtain a living polymer having functional group at its terminus using redox catalyst [Cu(I)/Cu(II)] (abstract) to produce polymers having polydispersity as low as 1.15. End functional polymers are being produced. Fig.3 shows, for example, ATRP of methyl Methacrylate in the presence of Cu(I)Cl and bipyridine initiated by 1-phenylethyl chloride. Suitable initiators are presented by a general formula $R_1R_2R_3C-X$ (col.7, lines 45, 46), wherein X is a

Art Unit: 1713

functional group defined in lines 50-58 of col. 8, and R11, R12 R13 are defined in col. 8, lines 60-67, col. 9, lines 1-15. X is preferably Cl or Br (col. 9, line 16, 18). Among the most preferred monomers Matyjaszewski names methyl Methacrylate, butyl acrylate, ethyl hexyl acrylate and styrene (col. 8, lines 40-44). Because the "living" (co)polymer chains retain an initiator fragment including X or X' as an end group, or in one embodiment as a substituent in a monomeric unit of the polymer chain, they may **be considered end-functional** or in-chain functional **(co)polymers**. Such (co)polymers may be used directly or be converted to other functional groups for further reactions, including crosslinking, chain extension, reactive injection molding (RIM), and preparation of other types of polymers (such as polyurethanes, polyimides, etc.) (col. 17, 58-67). End-functional PSt having a COOH end group was prepared according to the procedure of Example 3, except that 2-chloropropionic acid (1.74×10^{-5} mol) was used in place of 1-PECl.

The polymer was obtained in 50% yield, and had an M_n 39,600 and an $M_w / M_n = 1.45$. A telechelic PMMA with two Br end groups was prepared in ethyl acetate according to the procedure of Example 3, except that 1.00×10^{-4} mol $C_6H_4(CH_2Br)_2$ was used in place of 1-PECl, CuCl was used, and Bpy was present. The polymer was obtained in 100% and had an M_w / M_n of 1.35. (see Examples 10-12, col. 36, examples 21-23, col. 38). In all of the above examples the compound having a functional group is introduced during polymerization or at the end point of polymerization for further functionalization.

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 13-18 are rejected under 35 U.S.C. 102(a, e, b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over either one of Matyjaszewski or Shaffer, each one individually.

Because of the nature of product-by process claims, the Examiner cannot ordinarily focus on the precise difference between the claimed product and the disclosed product. It is then Applicant's burden to prove that an unobvious difference exists. See In re Marosi, 218 USPQ 289, 292-293 (CAFC 1983).

Art Unit: 1713

See also footnote 11 O.G. Notice 1162 59-61, wherein a 35 USC 102/103 rejection is authorized in the case of product-by-process claims because the exact identity of the claimed product or the prior art product cannot be determined by the Examiner.

Consult also *In re Thorpe*, 227 USPQ 964 (CAFC 1985), wherein product-by-process claims are rejected over a product, which although prepared in a different manner, appeared to be the same (prima facie) as the claimed product.

In the instant case there is no evidence, or no reason to believe that the process of polymerization as instantly claimed produces a different product, that of a polymerization of Matyjaszewski or Shaffer, as per *In re Thorpe*.

In the instant case no Graham vs. John Deere analysis was made but rather the test set out in MPEP 706.03(e) and In re Marosi was applied while explaining why the claimed product does not patentably distinguish over the prior art under 35 USC 102/103.

11. Other prior art references cited in PTOL-892 show the production of terminal group functional polymers by living polymerization.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tatyana Zalukaeva, PhD whose telephone number is (703)30-8819. The examiner can normally be reached on 9:00 - 5:30.

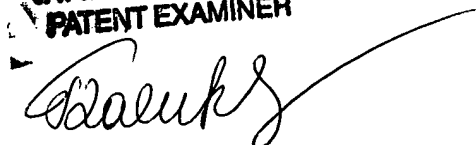
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on (703)308-2450. The fax phone numbers for

Art Unit: 1713

the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0651.

TATYANA ZALUKAEVA
PATENT EXAMINER

A handwritten signature in black ink, appearing to read 'Zalukaeva', with a long, sweeping horizontal stroke extending to the right.

February 25, 2003

Tatyana Zalukaeva, PhD
Primary Examiner
Art Unit 1713